ARITHMETIC STRUCTURES FOR PROGRAMMABLE
LOGIC DEVICES
Inventors: David Lewis et al.
Attorney Docket No. 306812005300

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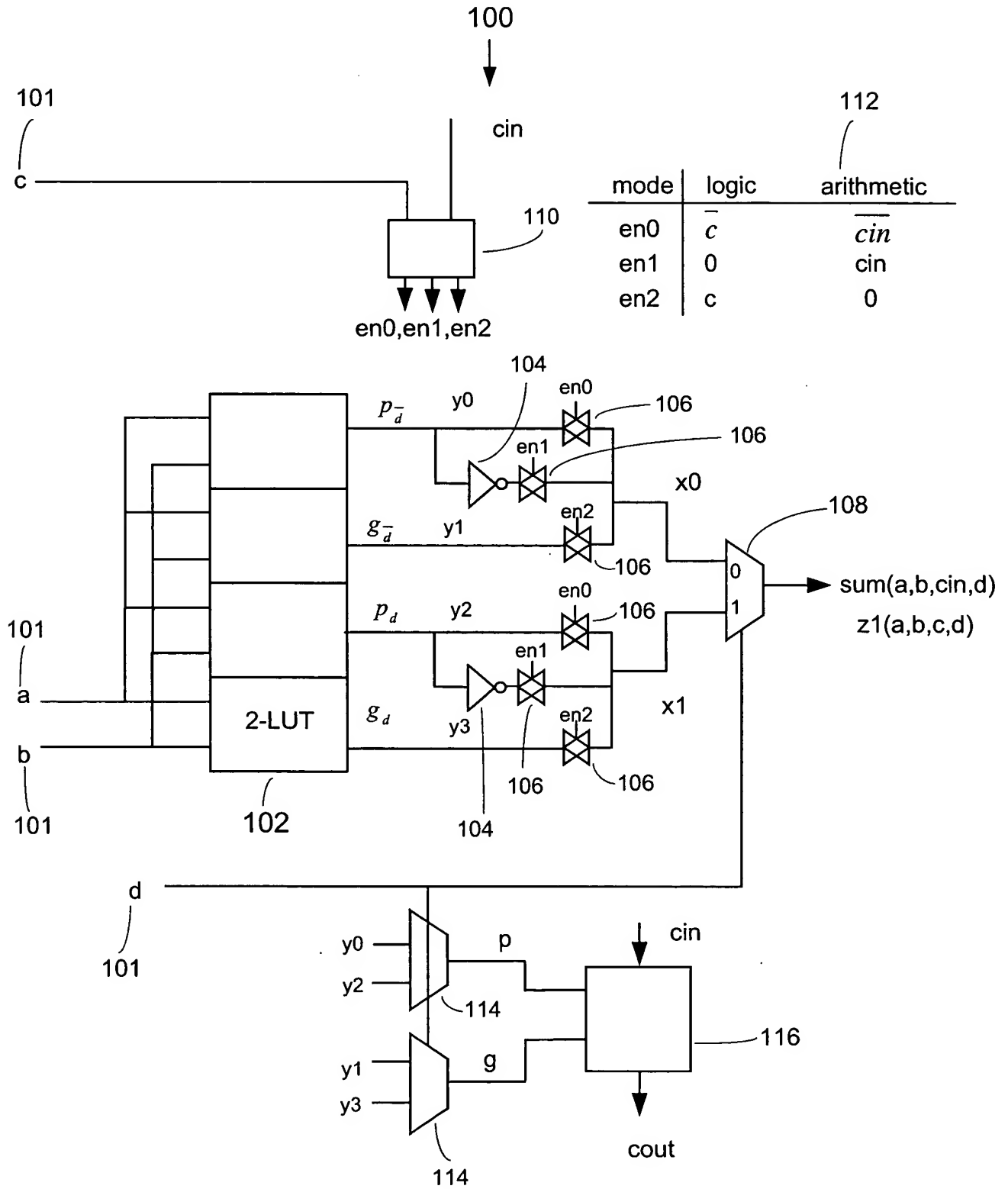
100

101

c

cin

110

en0,en1,en2

mode	logic	arithmetic
en0	$\overline{c}$	$\overline{cin}$
en1	0	cin
en2	c	0

112

104

$p_{\overline{d}}$ y0   en0   106

en1   106

$g_{\overline{d}}$ y1   en2   x0   108

106

p_d y2   en0   106

en1

g_d y3   en2   x1   106

106

sum(a,b,cin,d)

z1(a,b,c,d)

101

a

b

101

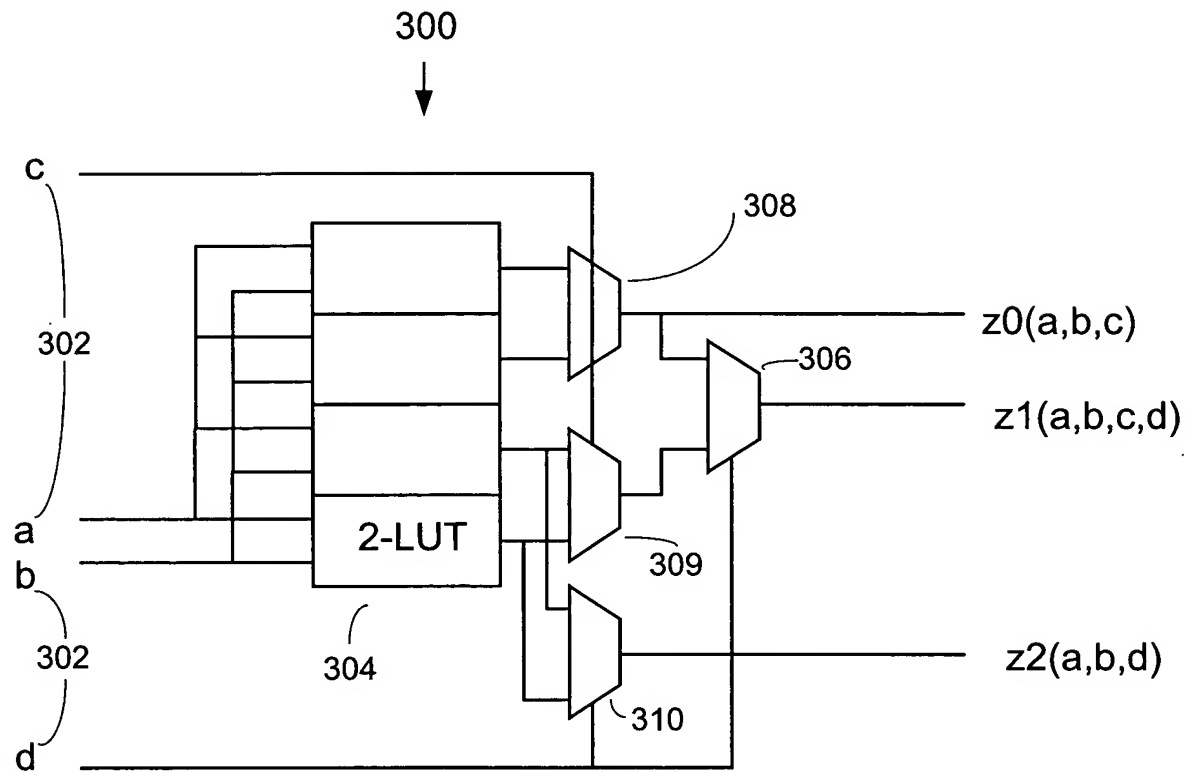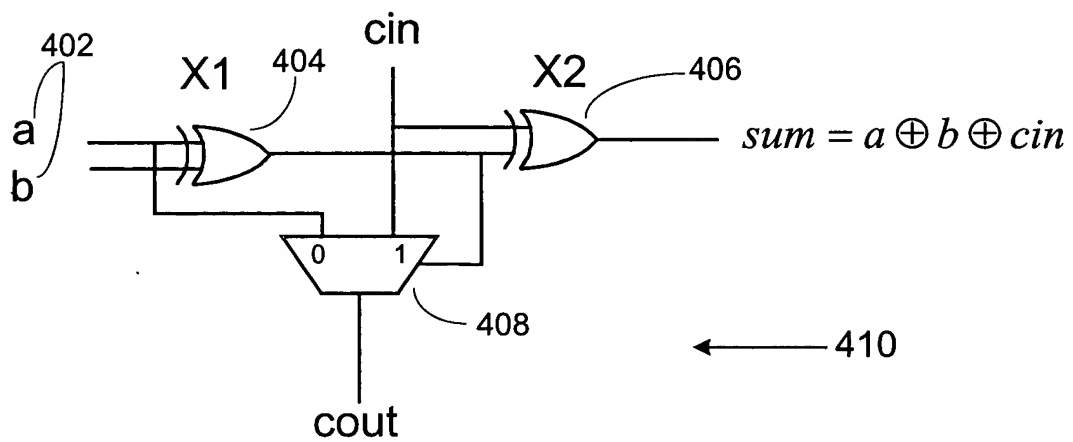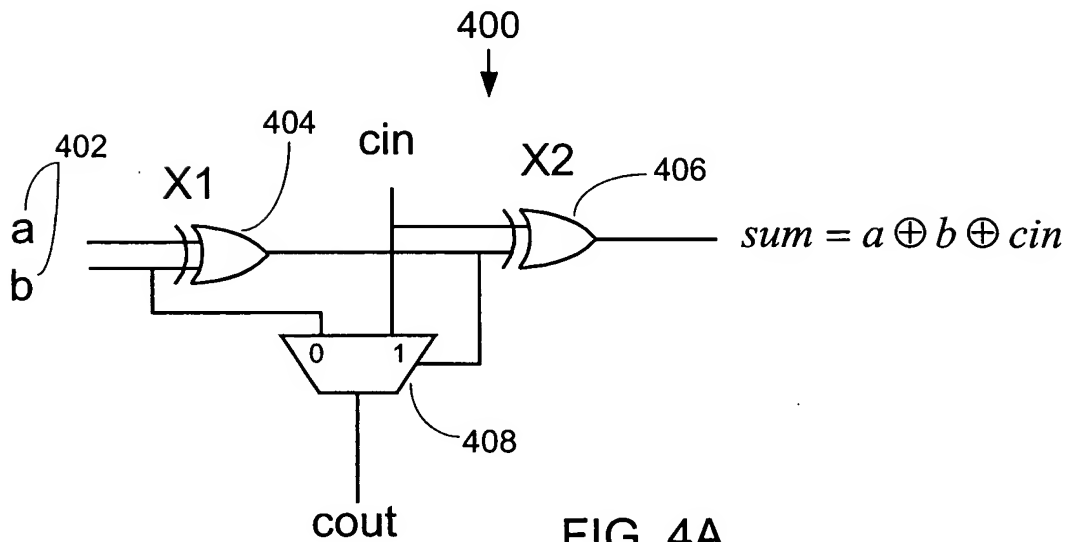2-LUT

102   104

d

101

y0

y2   p   114

y1

y3   g   114

cin

116

cout

FIG. 1

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200

240

242

241

215

242

212   211

FIG. 2B

219

250

250

240

250

215
Y

250

200

219

250

211

4-LUT

C

A

219

214

213

B

212

D

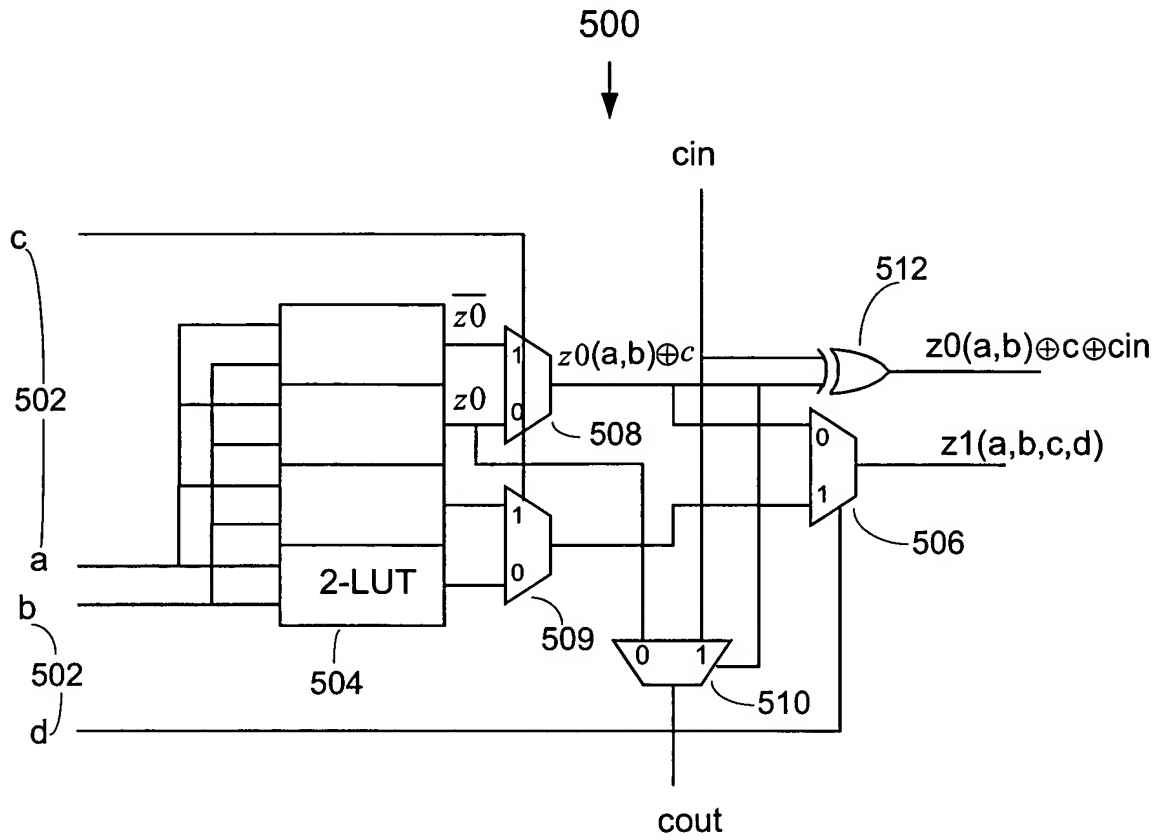FIG. 2A

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300

c

302

308

2-LUT

306

z0(a,b,c)

z1(a,b,c,d)

309

a

b

302

304

310

z2(a,b,d)

d

FIG. 3

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400

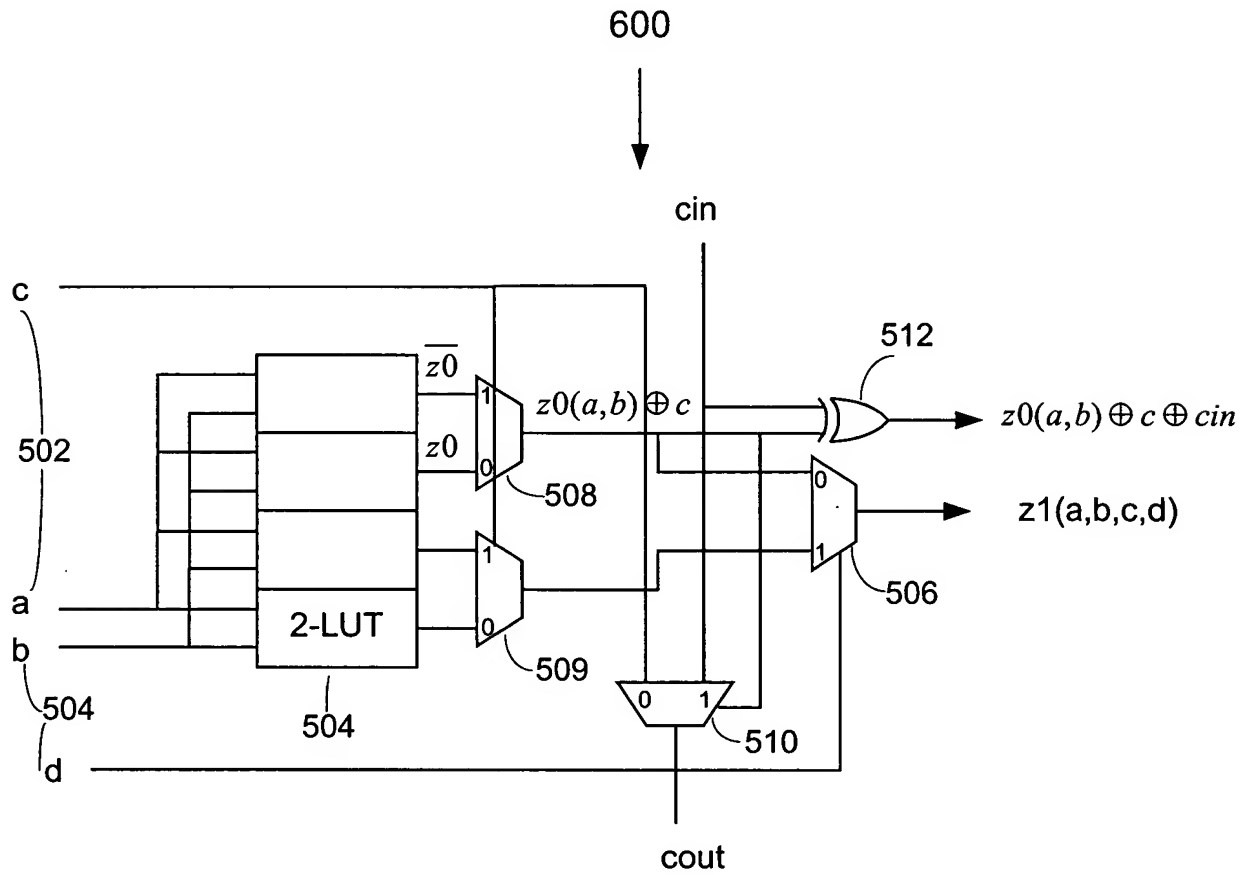402 X1 404 cin X2 406

a
b

$sum = a \oplus b \oplus cin$

0   1

408

cout

FIG. 4A

402 X1 404 cin X2 406

a
b

$sum = a \oplus b \oplus cin$

0   1

408

←——— 410

cout

FIG. 4B

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FIG. 5

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600

cin
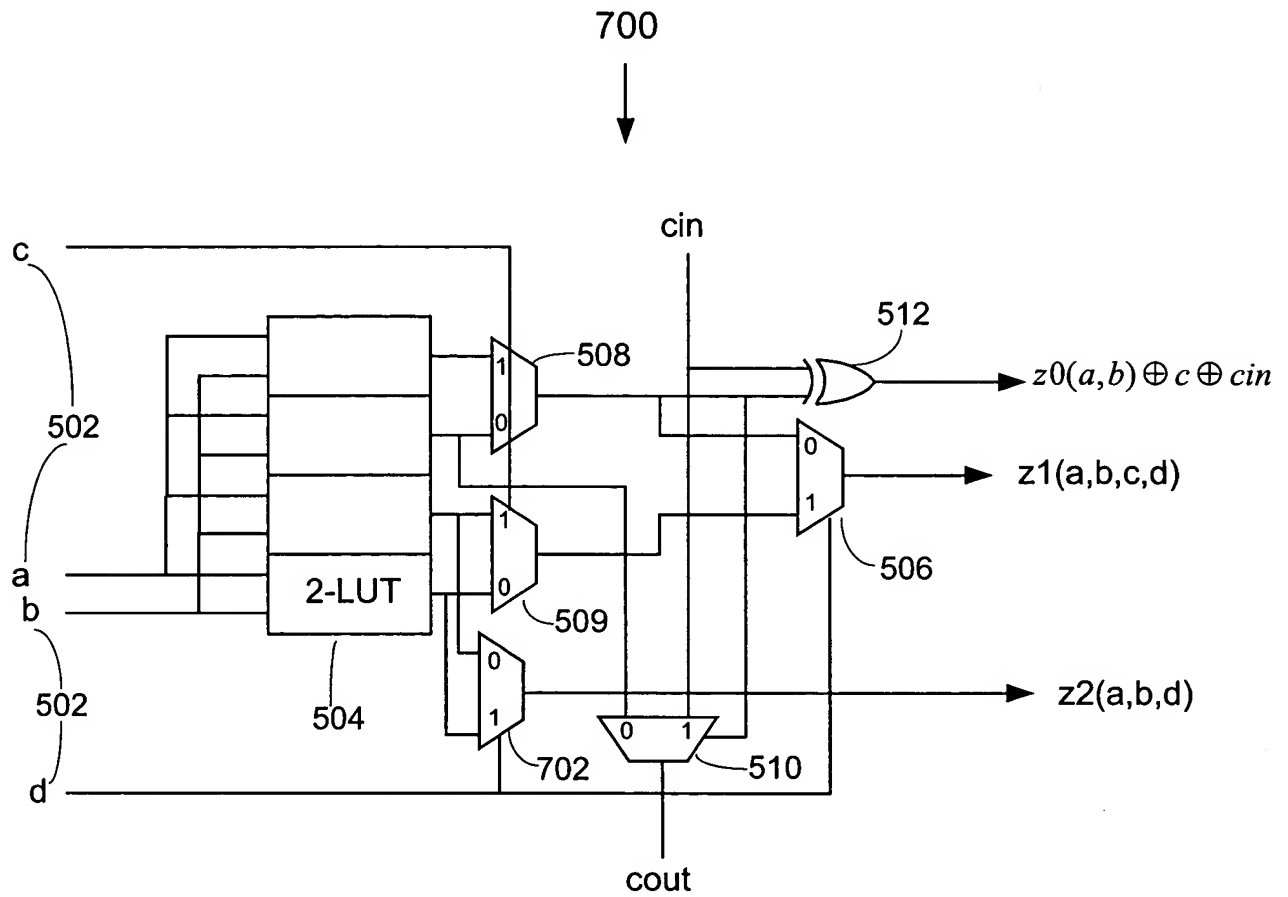
c

502

$\overline{z0}$

$z0$

$z0(a,b) \oplus c$

512

$z0(a,b) \oplus c \oplus cin$

508

a

b

2-LUT

509

504

504

506

z1(a,b,c,d)

510

d

cout

FIG. 6

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700

FIG. 7

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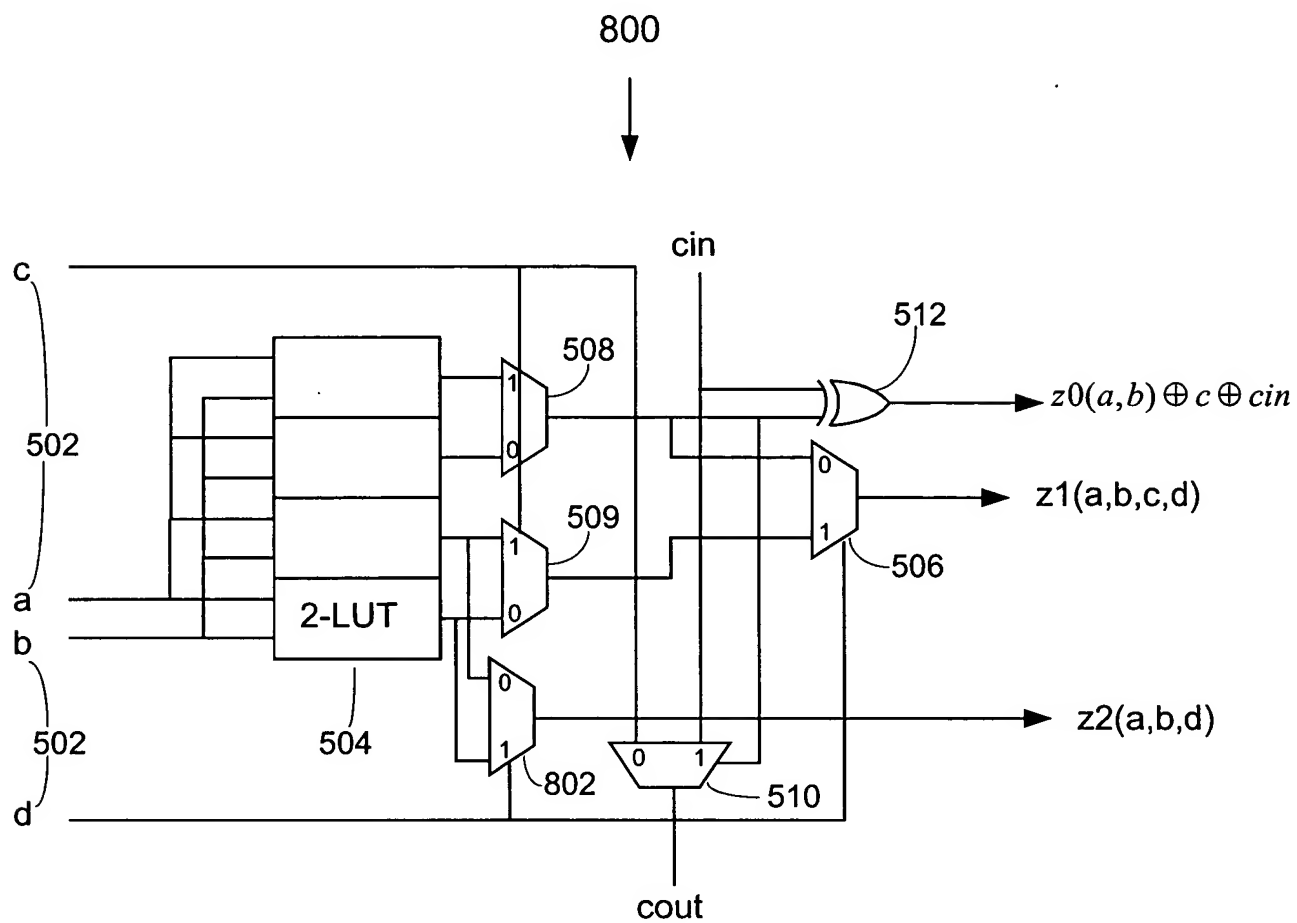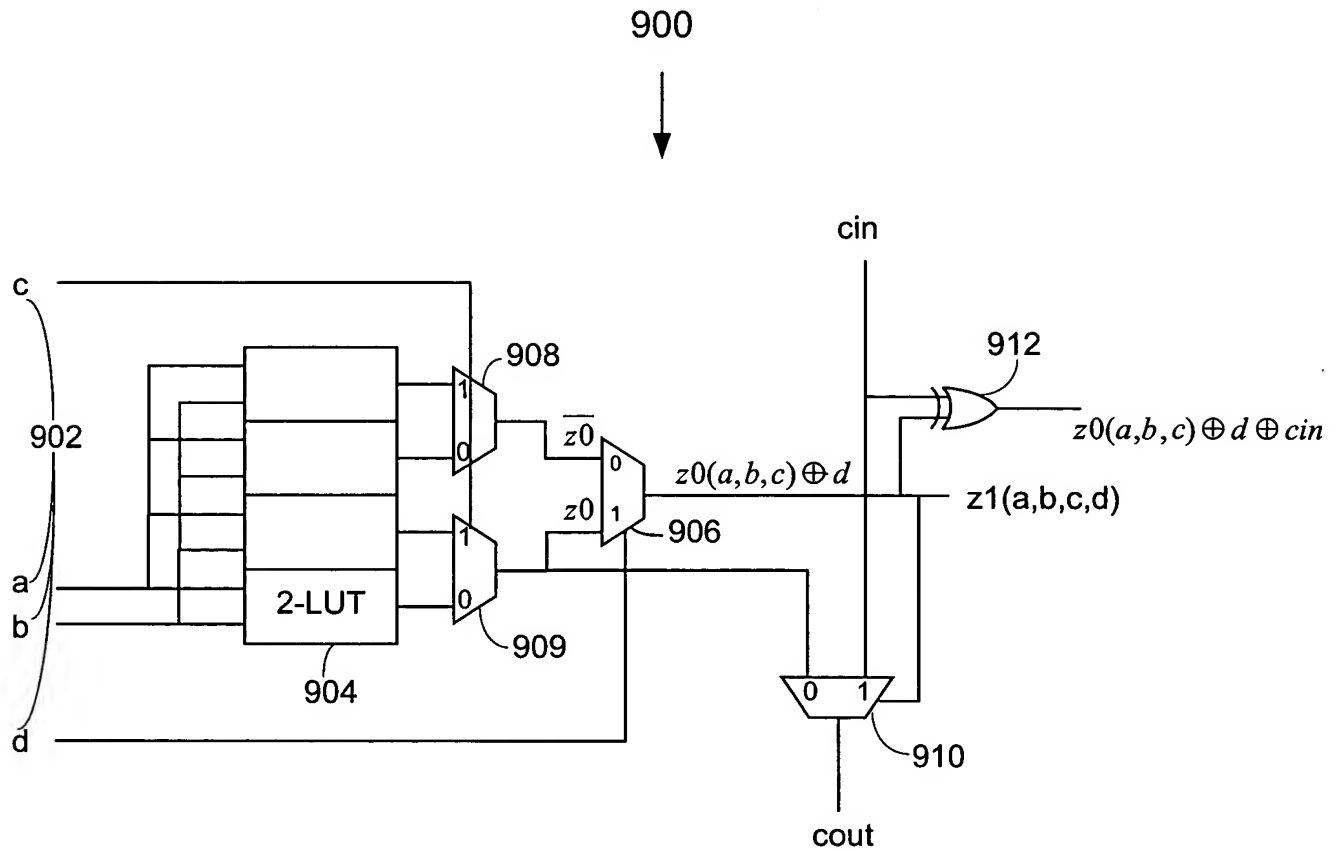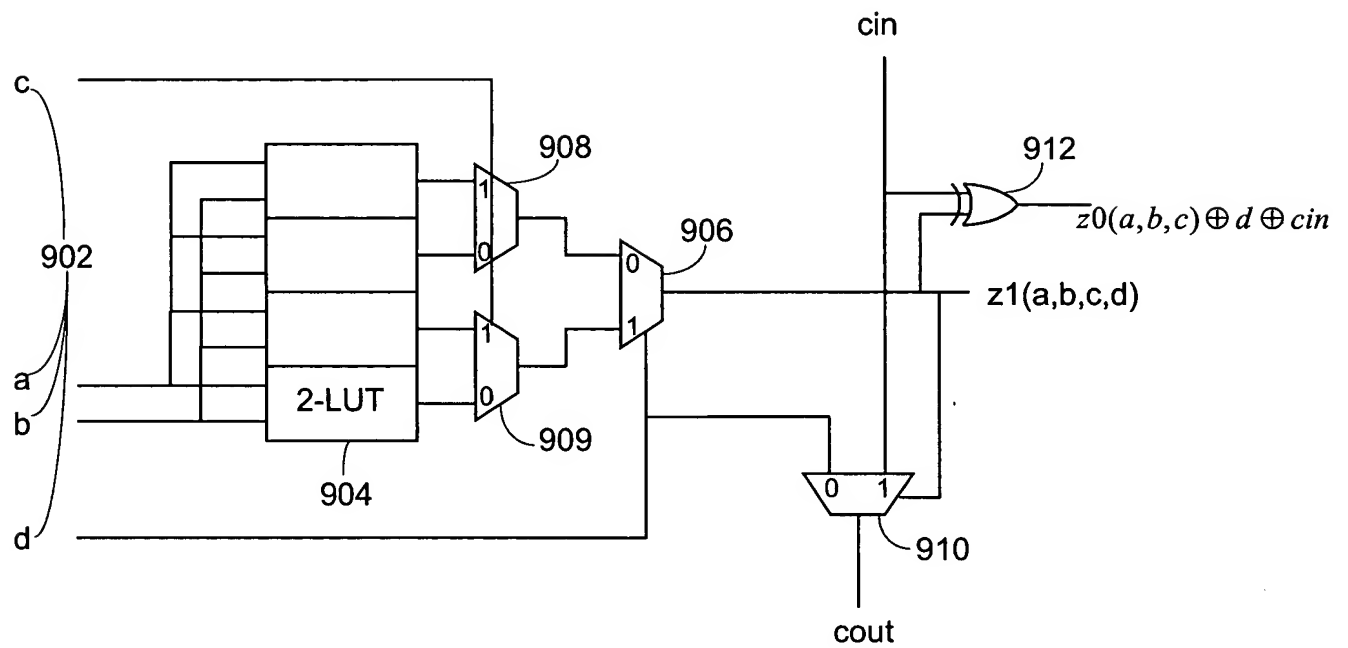Attorney Docket No. 306812005300

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800

cin

c

502

508

512

$z0(a,b) \oplus c \oplus cin$

509

z1(a,b,c,d)

506

a

b

2-LUT

z2(a,b,d)

502

504

802

510

d

cout

FIG. 8

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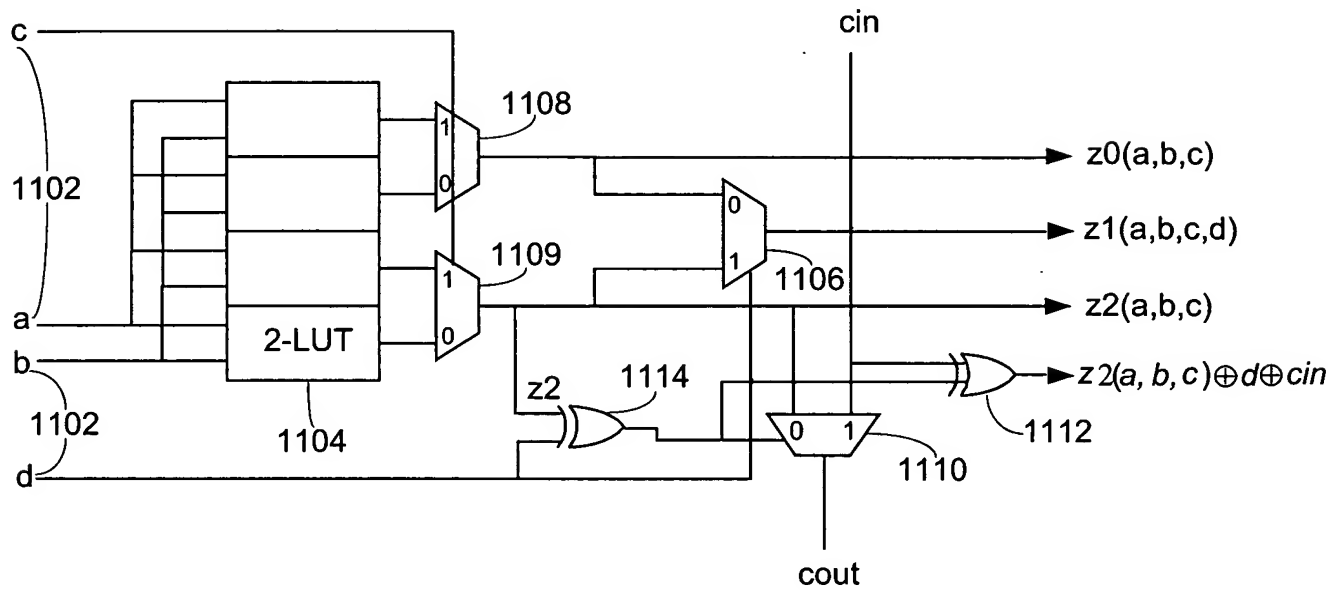Attorney Docket No. 306812005300

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900

FIG. 9

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1000

FIG. 10

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FIG. 11

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1200

FIG. 12

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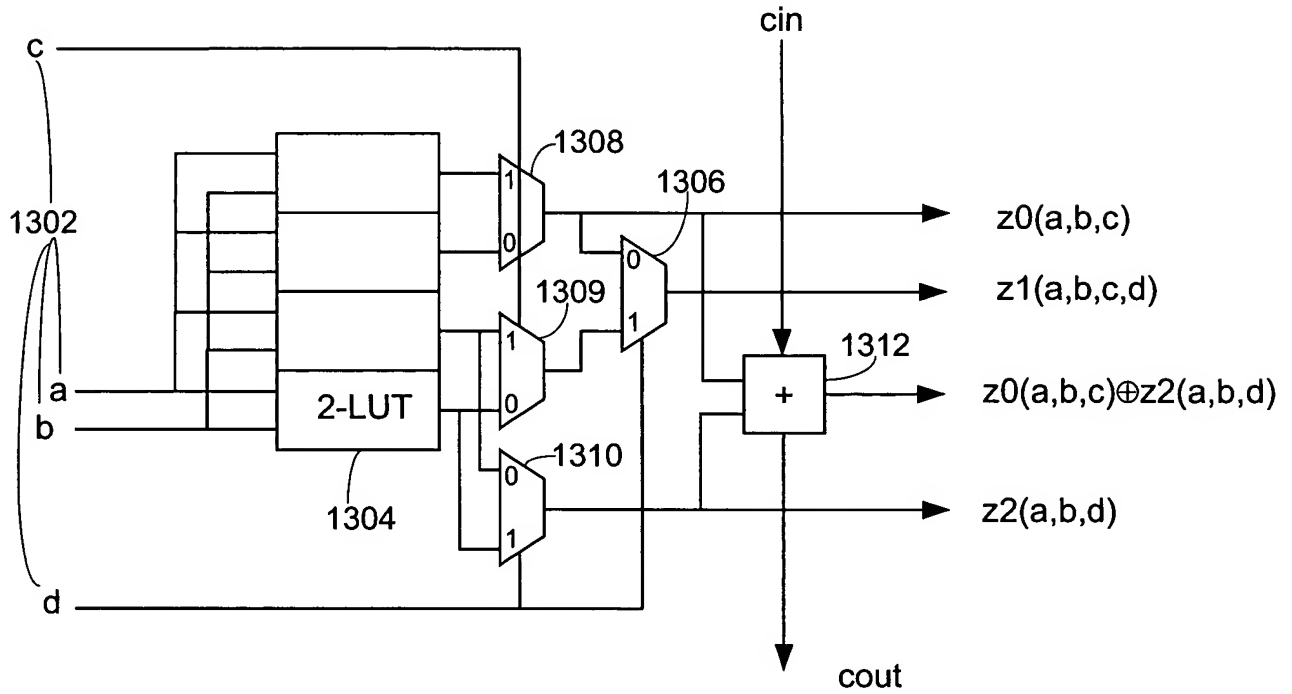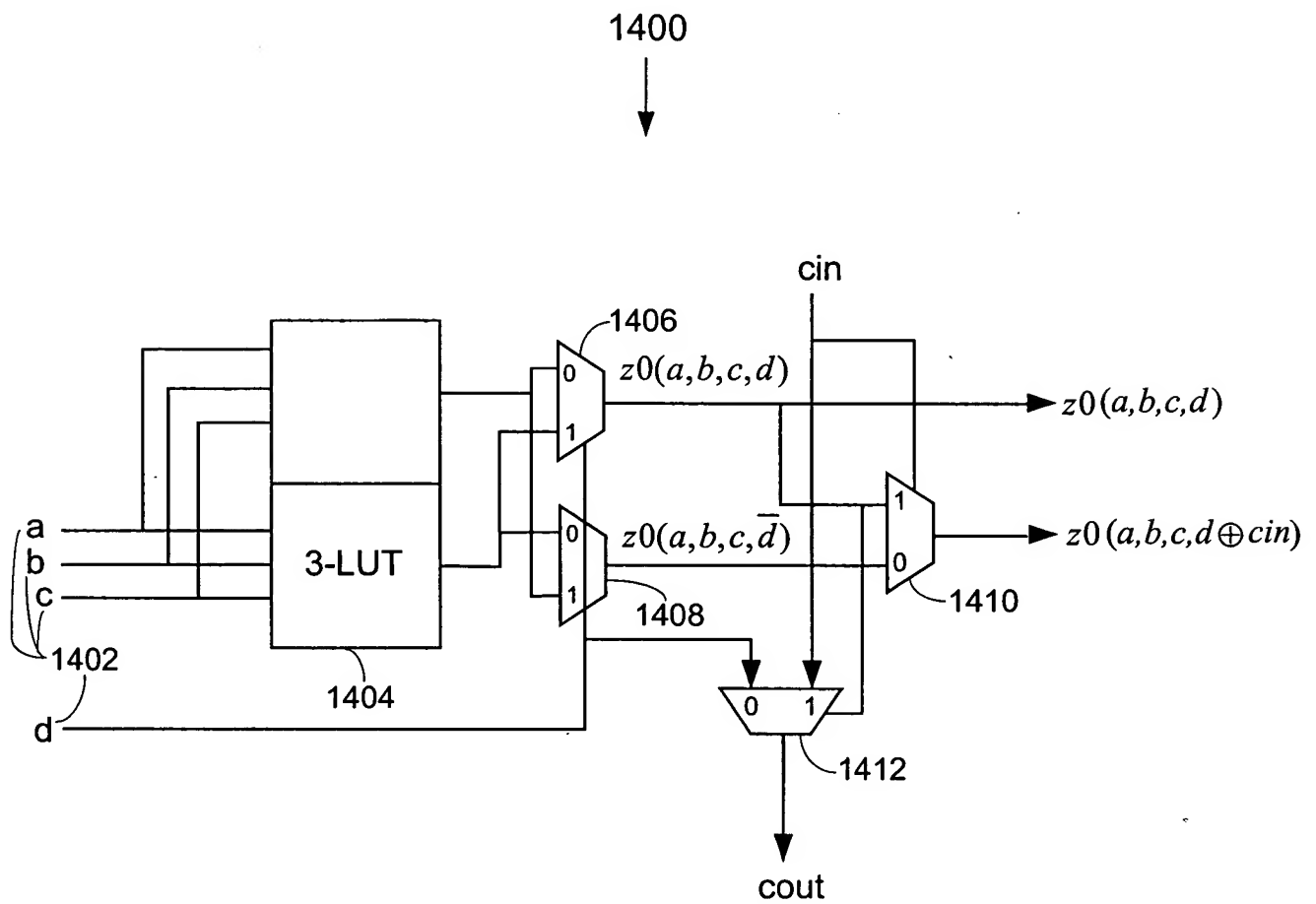Attorney Docket No. 306812005300

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1300

cin

c

1302

1308

1306

1309

a

b

2-LUT

1304

1310

d

1312

+

cout

z0(a,b,c)

z1(a,b,c,d)

z0(a,b,c)⊕z2(a,b,d)

z2(a,b,d)

FIG. 13

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1400

FIG. 14

ARITHMETIC STRUCTURES FOR PROGRAMMABLE
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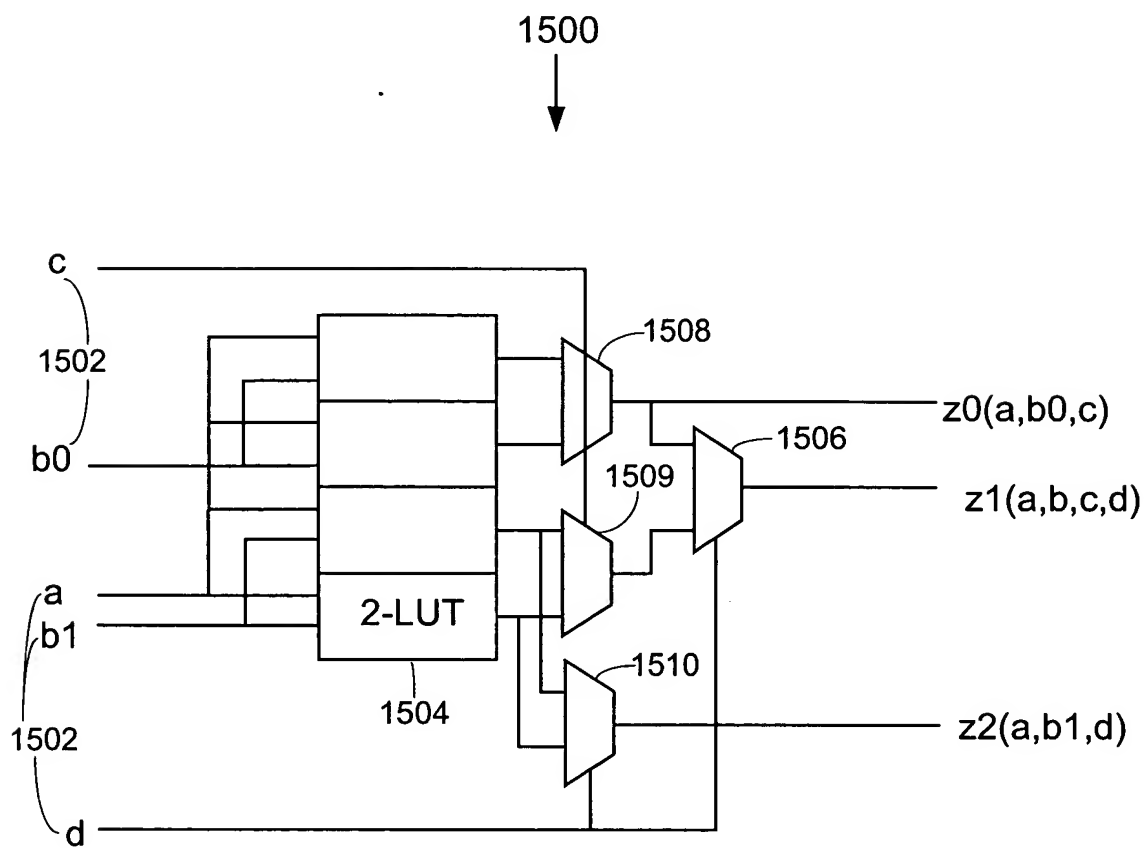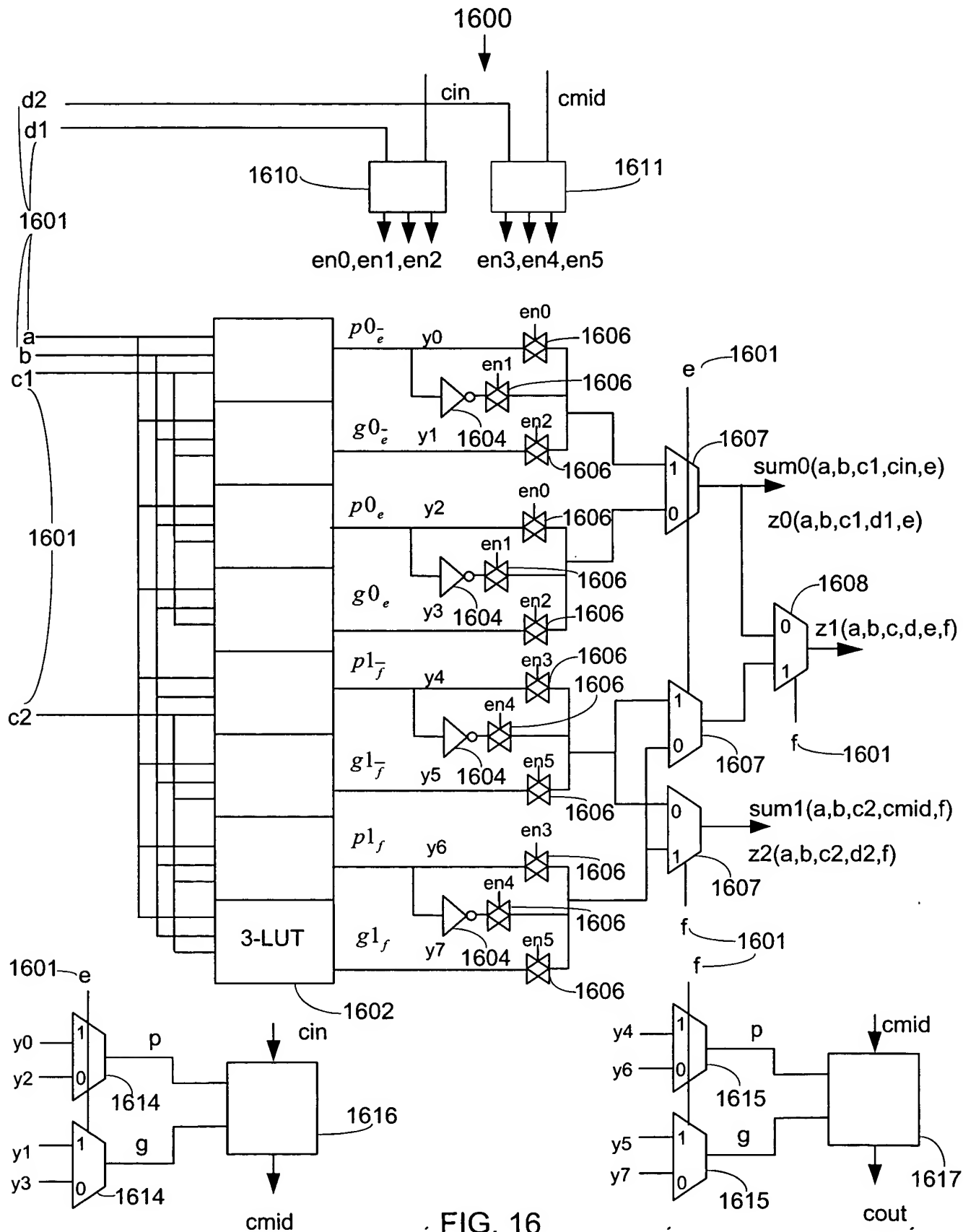Inventors: David Lewis et al.
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1500

c

1502

b0

a
b1

1502

d

2-LUT

1504

1508

1509

1510

1506

$z0(a,b0,c)$

$z1(a,b,c,d)$

$z2(a,b1,d)$

FIG. 15

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FIG. 16

ARITHMETIC STRUCTURES FOR PROGRAMMABLE
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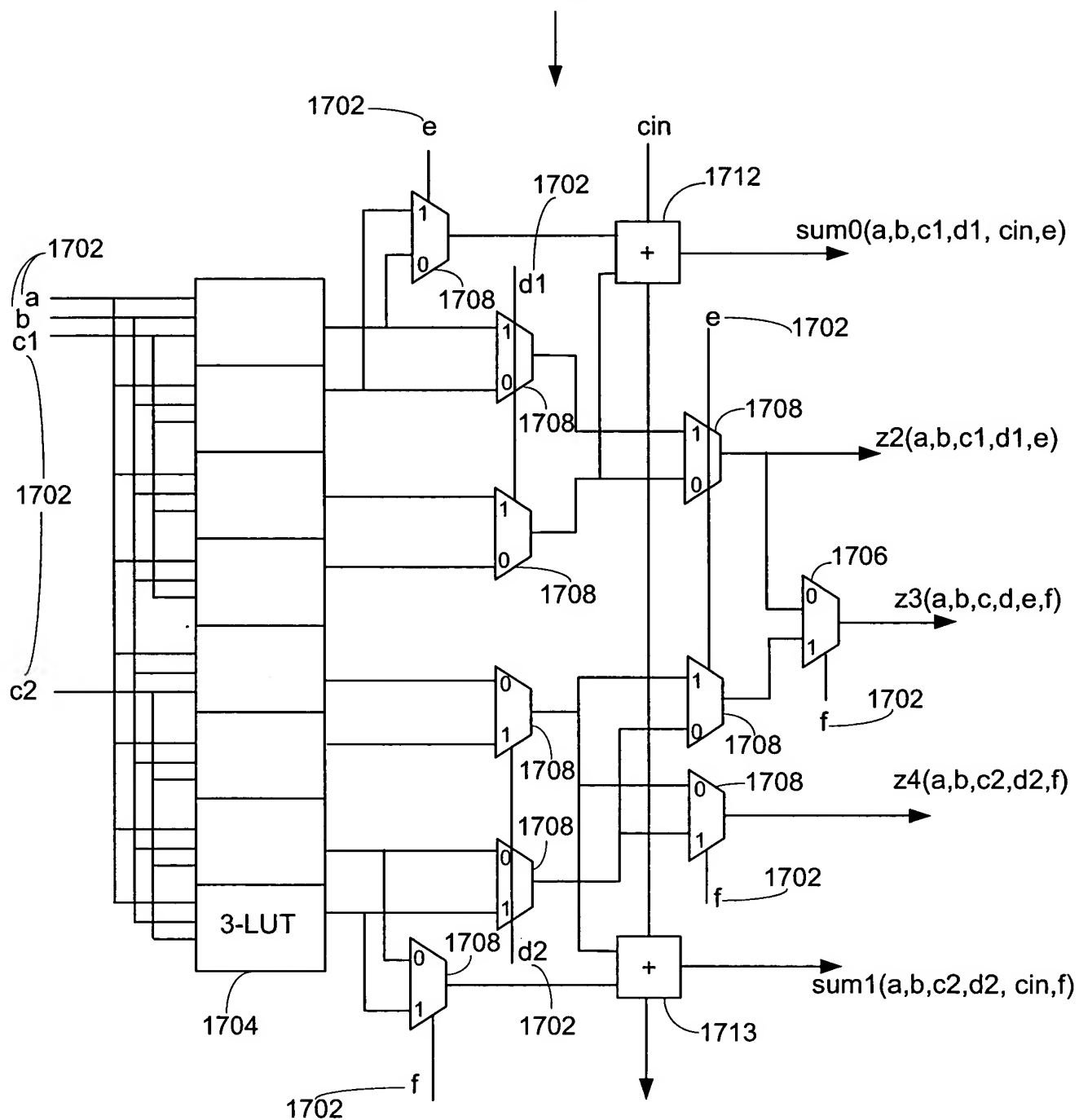FIG. 17

ARITHMETIC STRUCTURES FOR PROGRAMMABLE
LOGIC DEVICES
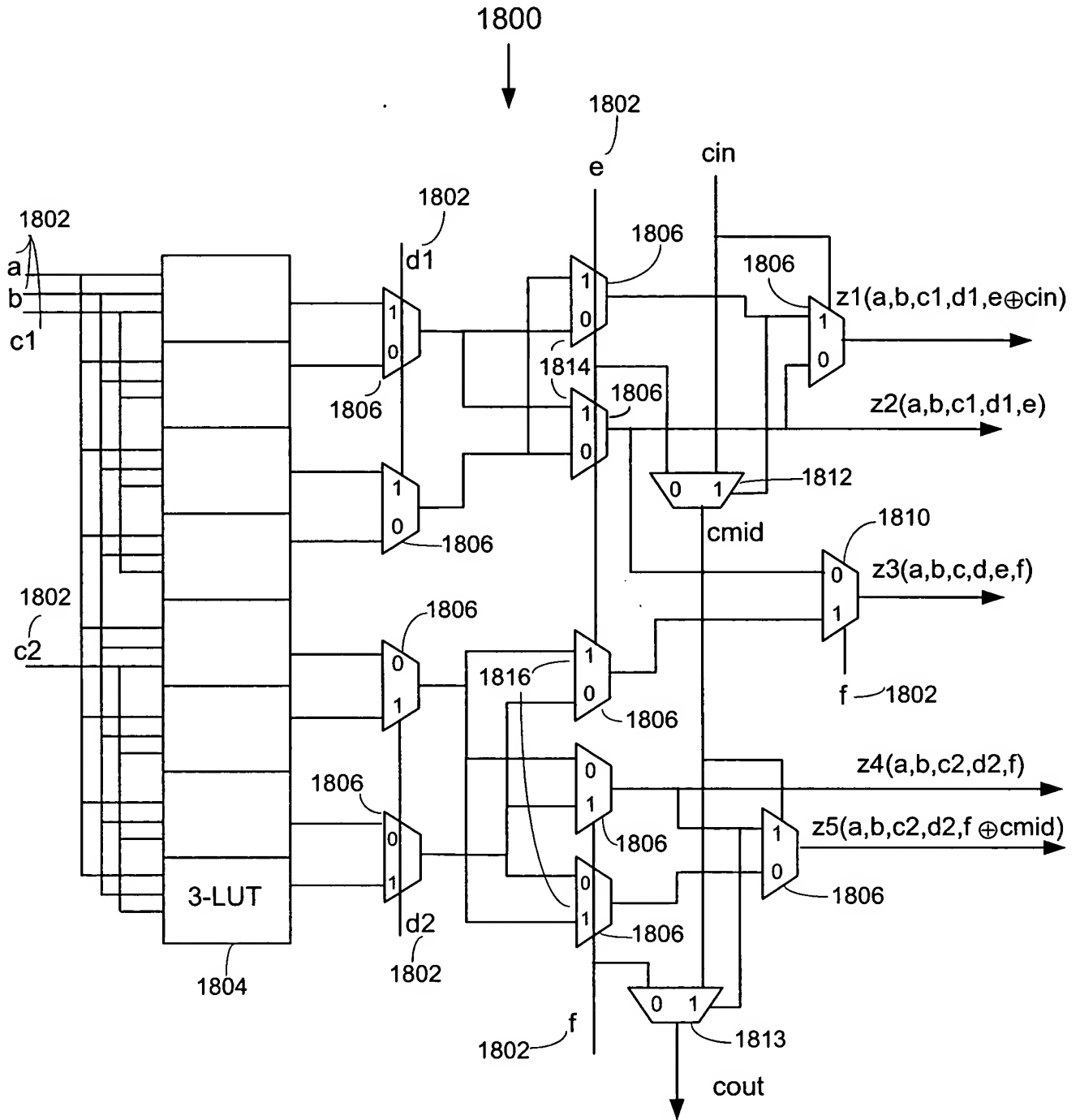Inventors: David Lewis et al.
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FIG. 18

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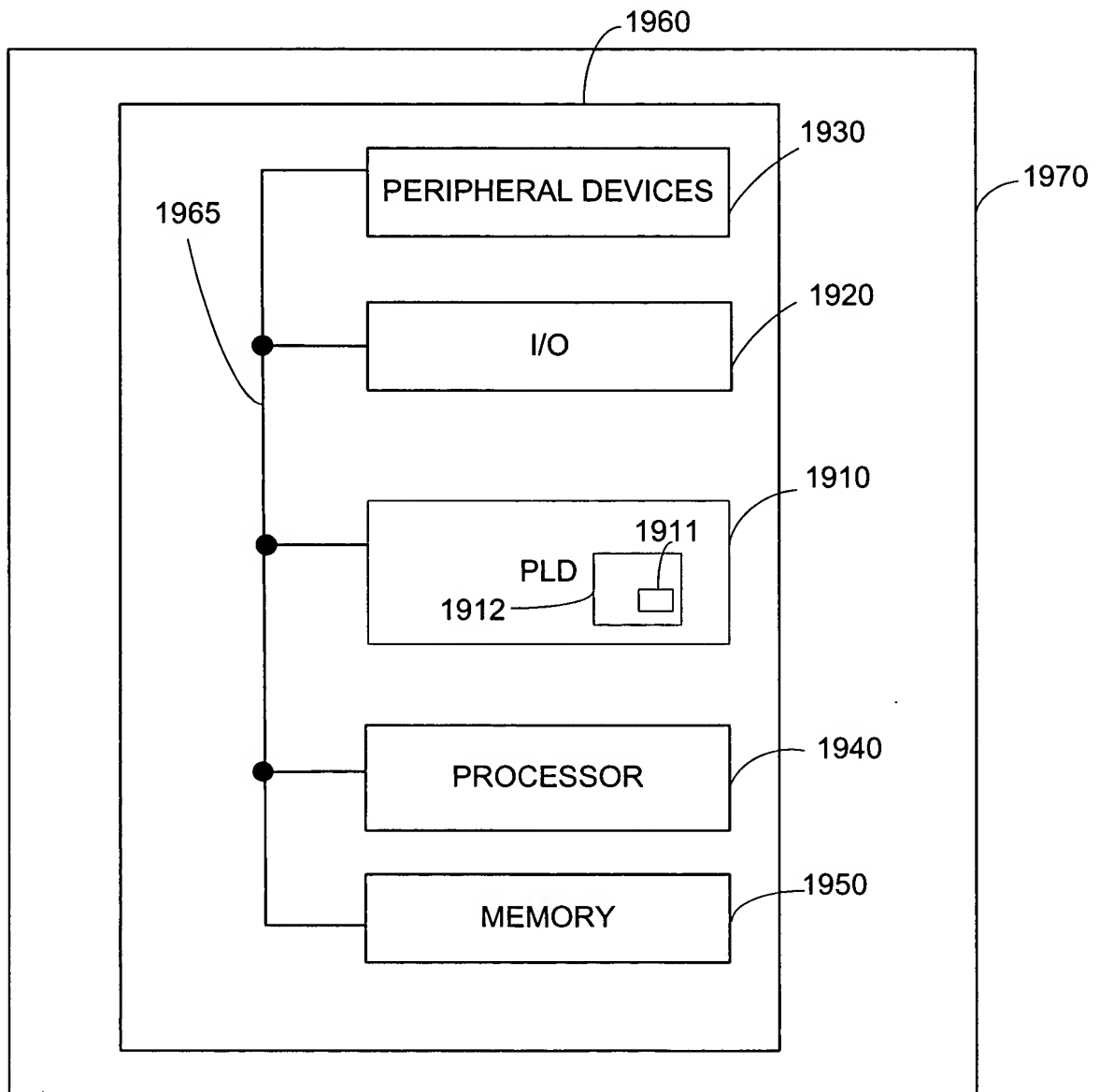Attorney Docket No. 306812005300

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FIG. 19